Draft for Staff Review

Boston Redevelopment Authority
CENTRAL BUSINESS DISTRICT PROJECT
June, 1963
PLANNING REPORT #2

CIRCULATION

Draft for Staff Review

This report is one of a series being prepared by the Boston Redevelopment Authority staff to explore and summarize various elements of the CBD planning work during the Survey and Planning period. It is to be used for analysis by the BRA, CCBD, Victor Gruen Associates and other CBD consultants as designated by the BRA. The report is subject to additions, alterations and deletions during the planning process. It is to be used during the planning of the CBD Project as a synthesis of the known facts and planning ideas to date, and is <u>not</u> presented as a policy statement.

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I. INTRODUCTION

In recent years, there have been many traffic reports made for the Boston Region, each of which makes projections for future traffic volumes and each of which has been different. Most of these are auto oriented, accepted the trends toward greater auto usage and did not attempt to achieve a balance between transit and auto trips. Most of the reports have been high in their estimates of the needs for automobile traffic and some, flagrantly so. (e.g. the Cloverdale and Colpitts report projected more auto trips to the Downtown in 1980 than all person trips in 1956).

To achieve the goals of improved environmental conditions in the CBD, the Regional Core Study, as revised for the Master Plan Report (Appendix II) forms the basis for any circulation plan for CBD. The plan proposes a proper balance between transit and auto in providing access to the Core. This means increasing transit patronage from 215,000 trips today to 245,000 trips in 1975 in order to maintain the present proportions of transit trips to trips by auto. (Alternative 3-p. 9, Appendix 1). Increase in the transit patronage makes it possible to limit the increase in peak hour automobile traffic without limiting accessibility by workers and at the same time provide enough extra capacity for off-peak hour auto use.

Part II describes the major existing points of access to the CBD. Part III describes the changes in the access point after implementations of the various roads under construction or accepted as BRA policy. Part IV describes various problems and possible approaches to their solution and may be added to as the planning process continues. Part V is a preliminary testing of the various approaches suggested and is intended only as a guide to planning.

PART II. EXISTING ACCESS TO THE CBD

Map A shows the pattern of existing access to the CBD. For topographical and historical reasons, the access to Boston's CBD is necessarily one-sided. Beacon Hill, the Common, the Public Garden, Back Bay, Government Center, South Cove stand in the way of any high volume, high speed penetrations from anywhere but the east. (Fig. 1)

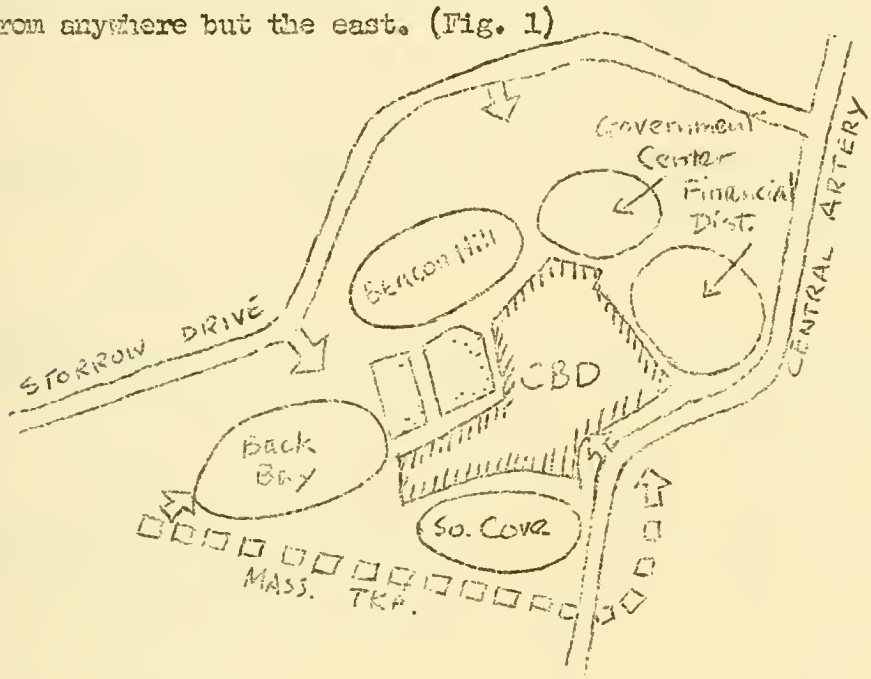

Fig. 1

This lopsided access is a disadvantage only in terms of traffic symmetry. In actuality, it gives Boston's CBD connections with other activity centers, residential areas, and large open spaces that are uninterrupted by large traffic volumes.

The following list details the main points of access to the CBD:

Ramps from the North on Central Artery: Dock Square - leading to Congress and Devonshire, High Street, Summer Street, Beach Street.

Ramps from the South: Kneeland Street, Lincoln Street, Northern Avenue to High Street.

Arterial Streets from the North: Cambridge Street to Tremont from Storrow Drive and Longfellow Bridge; Congress-Devonshire from Sumner Tunnel, Central Artery, and Charlestown.

Arterial Streets from the East: High Street from Central Artery, Summer Street from Central Artery and South Boston, Kneeland Street from Central Artery.

Arterial Streets from the South: Broadway from South Boston, Dorchester Ave., Morrissey Blvd.; Columbus Avenue and Washington Street from sector between Rt. 1 and South East expressway.

Arterial Streets from the West: Stuart Street from Huntington Avenue, Rt. 9 and Rt. 1; Boylston Street from Huntington Ave. and Rt. 1, western sector and Arlington Street ramp of Storrow Drive; Commonwealth from western sector; Beacon Street from Beacon Hill, Storrow Drive.

CBD PROJECT

EXPRESSWAY

ACCESS STREET

EXISTING ACCESS POINTS TO CBD

MAP A

BOSTON REDEVELOPMENT AUTHORITY

PART III. CHANGES IN THE POINTS OF ACCESS TO THE CBD

The following list outlines the roads under construction, proposed by various agencies or the BRA and how they will change the points of access to the CBD. In general, the most important change is the Mass. Turnpike extension and the resulting new access point in the vicinity of So. Station. (Fig. 1 and Map B)

GOVERNMENT CENTER CHANGES - (under construction)

The realignment of the street pattern in Government Center does not change Congress-Devonshire as the main entry point from the north to the CBD. It does clarify the pattern and marks the Congress-Devonshire entry point more precisely.

NORTH TERMINAL PROPOSALS - (BRA, City, DPW policy)

The changes in the North Terminal Area improve the surface connections from Charlestown and Cambridge (Rutherford Ave. Northern Artery) and feed them into New Congress Street and under artery.

IMPROVEMENT OF ARTERY SURFACE ROAD AND CONNECTION OF ATLANTIC-DORCHESTER AVES. - (BRA policy)

These changes will provide additional capacity for north-south traffic and should more evenly distribute the access to the CBD by adding access points from the east and the south. (Milk, Franklin, etc.)

MASS. TURNPIKE EXTENSION - (under construction)

The Turnpike serves the western sector and will channel portions of the traffic now using Route 9 and Storrow Drive. This will mean an important new access point to the CBD at Kneeland and South Street. The Turnpike traffic can also feed into the Central Artery. Since the Artery is already being used to capacity, the problem of distributing CBD-destined traffic should be solved on surface streets.

CHANGES RELATED TO TURNPIKE EXTENSION -(BRA proposal)

The proposed Collector-Distributor roads along the turnpike will serve to relieve the Stuart-Boylston corridor of distributing turnpike traffic. Boylston-Stuart are needed to serve the arterial streets from the west and to maintain mobility between the various activity centers.

The Collector-Distributor roads will connect to the artery surface road and the Dorchester-Atlantic Avenue forming a system of high volume roads that will run along the preimeter of the intense activity area, carrying traffic to points close to its destination before feeding it onto the local streets.

PROPOSED ACCESS POINTS TO CBD

MAP B
BOSTON REDEVELOPMENT AUTHORITY

PART IV. SPECIFIC PROBLEMS

Servicing will be treated in separate papers. This report will deal more generally with the problems of a framework of streets into which the more detailed problems of servicing and parking can be fitted.

INTERNAL TRAFFIC

Practically all streets in the CBD are now being used indiscriminately for all purposes. So that parts of Washington and Summer-Winter Streets may be assigned to strictly pedestrian use and compatible transportation and pedestrian mobility throughout the CBD may be improved, the system should be clarified so that fewer streets can do the same job. This means reassigning of long distance through traffic, simplifying the connections with the expressway, Collector-Distributor roads, and major arterial streets, and assigning specific destinations to feeder streets.

There are several approaches to the solution of the problem. One that has been proposed in connection with the major retail area is a loop-road system which makes possible a pedestrian area free of vehicles except for cul-de-sac services streets and which is entered from various feeder streets.

Fig. 3

The disadvantage of this solution are the inflexibility of the loop road and the circuitousness of access. If there is a breakdown or jam on any part of the road, the entire system is jammed. Also, if the destination is at A and system is entered at B, (Fig. 3) then the traffic must travel around the entire perimeter of the loop.

This may work if the loop road were similar to one in a suburban shopping center which just serve the area enclosed, (Fig. 4) but the loop road is made up of pieces of streets that extend beyond the area and must carry traffic that originates and is destined outside the loop (Fig. 5)

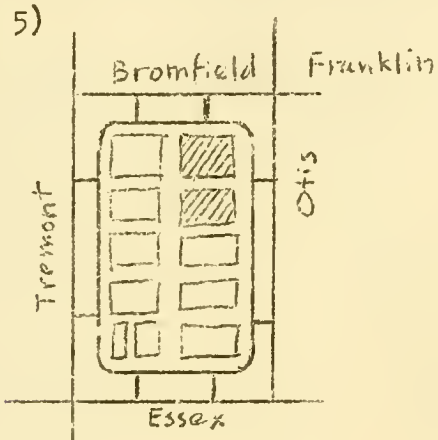

Fig. 4

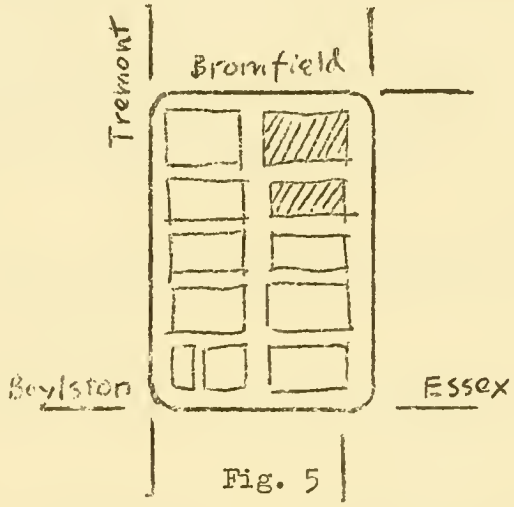

Fig. 5

Another approach is the extension of the feeder streets into a framework that will serve the major retail area and the other activity centers in the CBD (Fig. 6). Two schemes were developed from this concept, one of which does not alter the system outside of the area, while the other requires some basic changes (such as the reversal of Tremont Street). Both attempt to clarify the system particularly in its relation to the Central Artery and the other surrounding areas.

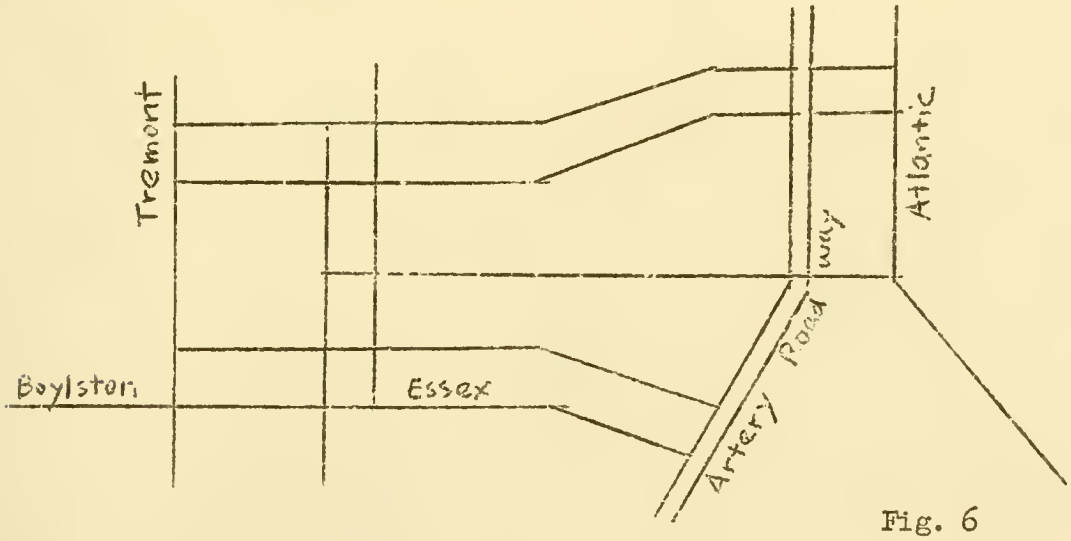

Fig. 6

V PRELIMINARY TRAFFIC ASSIGNMENTS

In order to test the VGA proposal and the two schemes devised by the BRA Staff, some preliminary assignments to the road system were made on the basis of the present level of service.

From inspecting the volumes of existing flows, (as measured by Wilbur Smith and Associates) we decided that a sufficiently accurate model of the Downtown could be constructed by

(a) dividing all trips crossing a cordon (see Map C) around the area into through trips and destination trips

(b) assigning destinations to five areas in the downtown (See Map C)

By studying the turning movements at main intersections we determined that approximately half of the 80,000 vehicles crossing the cordon are through trips, three-eights are destination traffic, and one-eight are trips which enter and leave the cordon area only to re-enter the area at some other point as destination trips. The volume and direction of through trips was determined to be those shown in Fig. 7

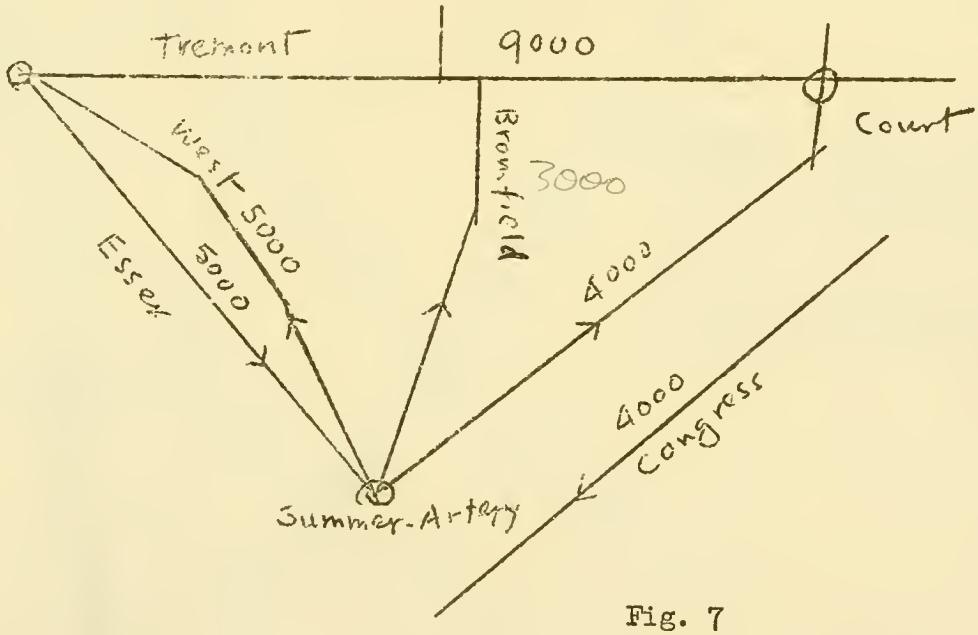

Fig. 7


BOSTON COMMON
PUBLIC GARDEN
Boylston
Arlington
Charles
Tremont St.
Washington
Bromfield
Winter
Sumner St.
Franklin
Court
New Congress St.
Water
Milk
High
Federal
Atlantic
Essex
Kneeland
Lincoln
Harrison
Kneeland
Beach
South
South STATION
7500
3000
6000
4000
6000
10/10
10/10
25/20
10/10
10/10
25/20
0/20
10/10
CORDON LINE
PERCENTAGE 1962/1966 OF DESTINATION TRAFFIC
NO. OF VEHICLES DESTINED FOR AREA
N

MAP C

and the number of trips generated by the various destinations were estimated to be those shown in Map C. Traffic was assumed to orignate from nearby roads in the proportions shown in Map C, the difference between the 1963 and 1966 proportions being carved by the effect of the turnpike extension. The assignments do not account for future increases in land uses.

To test the validity of this model, we used it to generate trip assignments theoretically to the existing downtown street pattern, assigning trips to the destinations and back from each of the arteries. The resulting assignments corresponded fairly closely to the measured volumes, indicating that the model is sufficiently reliable for making preliminary assignments.

Using the model to make assignments for the loop road suggesting by VGA (see Map D), we found that the loop road would be unable to maintain the present level of service to and through the area. Besides this, in assigning flows to the system, the loop road was avoided whenever possible in order to minimize the loads on it. While this procedure enables the loop road to be almost sufficient, it really understates its inadequacy. If congestion forces people to avoid the loop road and to use only the unavoidable segements near their destinations, the one advantage of a loop road, i.e. its clarity, is lost. Also, the traffic avoiding the loop road was assigned to other roads outside the system, which (we assume) are already fully used. The proposed loop encloses an area of approximately 1600 ft. by 1200 ft. Taxi and drop off service to this area would necessarily be impaired unless the area were penetrated for these purposes.


Charles St.
Commonwealth Av.
PUBLIC GARDEN
BOSTON COMMON
25,000
Park St.
Court
New Congress
State
10,000
Water
Milk
Devonshire
Bromfield
Winter St.
14,000
Tremont St.
Washington
Summer St.
Franklin
Otis
Federal
Congress
Pearl
Oliver
High
Atlantic
12,000
17,000
Boylston
Arlington
Stuart
Kneeland
Essex
Harrison
Artery Roadway
South St.
SOUTH STATION
Dorchester
000 VEHICLES/DAY
N
MAP D

Using the model again to generate assignments on the two proposed systems, we arrive at the assignments shown in Maps E and F. In both of these systems, added streets greatly increase the capacity and flexibility of the system, and avoid forcing traffic out to already overcrowded streets in nearby areas. Between the two proposals, the second (Map F) seems preferable as it results in less recirculation of traffic, leading to lower volumes, and results in a pattern which is slightly clearer. Probably the effects of the two systems on the surrounding areas are more important considerations that these small differences,making any judgement on this question premature.

Besides the question of street system, we tested the effects of new close-in, short-term parking. These garages would cause significantly higher loads on the street system. Assuming the minimum car storage suggested at the four locations proposed in VGA Map "Existing and Proposed Parking" of 4 April 1963, we get additional assignments on the loop road approximately equal to those accommodating existing flows. In view of these estimates the tentative suggestion must be that no further close in parking of significant magnitude be provided without a complete study of the entire system.

It should be emphasized that the above analysis is of a preliminary nature, and meant to be indicative of areas in which more fruitful investigations can take place. It is not intended as a final proposal.